Attachment 5 –Work Plan

ATTACHMENT 5 – WORK PLAN

The work plan should include, at a minimum, the following items:

- *Scope of the proposed project including (as appropriate) maps of agency area and area of proposed tasks;*
- *Specific purpose, goals, and objectives of the proposed project related to improving groundwater management and implementing the GWMP and/or where applicable the IRWM Plan;*
- *Work items to be performed under each task of the proposed tasks (consistent with the budget and schedule);*
- *Present a sound strategy for evaluating progress and performance at each step of the proposed project.*
- *Project deliverables for assessing progress and accomplishments, which include quarterly progress and final reports.*
- *If access to private property is needed, provide assurance that access can be granted. For example, if wells will be constructed or sampled on private land, submit a letter or agreement that demonstrates that access for well construction and monitoring on the property has been obtained.*
- *Explain the plan for environmental compliance and permitting, including a discussion of the following items: a description of the plan, proposed efforts, and approach to environmental compliance, including addressing any CEQA obligations in connection with the proposal; a listing environmental related permits or entitlements that are* needed *for the project; and any other applicable permits that will be required. Briefly describe the process and schedule for securing each permit/approval. Discuss necessary local drilling permits and the submittal of Well Completion Reports to DWR. Describe the proposed process for securing each environmental permit and any other regulatory agency approval.*

Scope of Work/Work Plan

The Amargosa Project will consist of three distinct items: the construction of a monitoring well, equipping of wells and collection of water level and water quality data, and updating and calibrating the model.

Task 1: Project Management

Included within this task is the update of the existing work plan through the coordination of DWR's LGA Program Project Manager. This task also includes the overall administration of the grant agreement contract required through the project duration.

Also included in this task, the City will maintain overview of USGS's effort to meet the scope of the Project. In addition, the City will track the progress of USGS towards completion of the Project in order to ensure all project deliverables are completed within the proposed budget and on schedule.

Task 2: Grant Administration and Reporting

As per DWR's LGA Contract Template, the submittal and approval of all reports is a requirement for the successful completion of a Grant Agreement. Reports shall meet generally accepted professional standards for technical reporting and shall be proofread for content, numerical accuracy, spelling, and grammar prior to submittal to State. All reports shall be submitted to the State's Project Manager, and shall be submitted in both electronic and hard copy forms. Reports to be submitted to DWR's Project Manager include:

- Quarterly Reports: For the duration of the Grant Agreement, the City will submit to State quarterly progress reports on the status of the project. Reports shall be submitted by the last day of January, April, July, and October for the preceding quarter. These reports shall include a description of project operations to date and their effectiveness, any data developed or information gained, any costs incurred, and any problems encountered or benefits achieved as a result of the work accomplished to date. Quarterly reports shall include a statement of progress compared to the proposed schedule and a comparison of actual costs to date to the budget.

Task 3: Well Permitting

It is anticipated that the proposed project well installation site will not be subject to any environmental permitting. The proposed site for the well has been previously disturbed. As such, the construction of a new monitoring well will not require additional CEQA documentation.

However, a permit will be required from the County of Los Angeles for the drilling and construction of the proposed well. Other required permits include the County Department of Public Health for the construction of the well. Under this task, the applicant will ensure that the appropriate permits will be obtained.

Task 4: Groundwater Monitoring Well Construction

The applicant in conjunction with USGS documented the locations of several previously unknown faults down gradient of the proposed project site. Water-level data indicate that these faults are partial barriers to groundwater flow. Understanding how these faults may affect groundwater flow is needed to determine the feasibility for recharge in the area and to refine the current groundwater-flow model. To date, data collected only documents the existence of these faults and limited information about hydraulic properties. To better determine the hydraulic properties of these faults, the applicant is proposing to construct a monitoring well within the boundaries of these faults. In addition to providing hydraulic properties of faults, the new site will provide information about vertical and horizontal differences in water level and quality, aquifer properties, and will be used to update the groundwater-flow model. The monitoring well

site will be constructed with multiple 2-inch diameter PVC piezometers; the perforated intervals will be determined from analysis of cuttings and geophysical logs collected during drilling at the site.

Drilling operations will be conducted on a 12-hour-per-day basis by USGS personnel, with City oversight. Soil cores will be collected at changes in lithology, and if feasible, from the bottom of the hole. All construction equipment and supplies needed for the well construction and instrumentation of the site will be provided by the USGS. A USGS hydrologist will be on-site during the entire drilling and construction process to analyze and log the drill cuttings, interpret the borehole geophysical logs, and provide the final monitoring-site design.

The monitoring well will provide information on the (1) lithology of the basin fill deposits, (2) aquifer properties, (3) water levels (4) groundwater gradient, and (5) how inferred faults may or may not affect groundwater flow.

Task 5: Groundwater Monitoring Program

The applicant will implement a robust groundwater monitoring program that will not only utilize data from the newly constructed monitoring well, but will incorporate monitoring data from two existing monitoring wells. The wells will be equipped with instrumentation that includes pressure transducers to measure changes in water level and temperature probes installed at various depths within the wellbore to measure changes in temperature as result of movement of natural and proposed artificial recharge. All data from these instruments will be downloaded quarterly and entered into the USGS database with appropriate quality assurance.

In addition, the applicant will collect water quality samples from the monitoring well sites to document current water-quality conditions, which will be used to compare and contrast with changes in water quality. This data will be useful in documenting baseline conditions in the basin prior to recharge activity occurring. Water quality sampling will occur on an annual basis and will be ramped up to quarterly once recharge commences. Changes in water chemistry will be used to help track the movement of artificial water. The quality control will include analyzing duplicate samples and/or field blanks.

Parameters to be measured include: major ions, nutrients, selected trace elements, and the stable isotopes of oxygen, hydrogen, and carbon-13, and radioactive isotopes tritium and carbon-14.

In addition to water quality, water level measurements will also be collected. Once collected this data will be documented by the stakeholders in the region and will also be forwarded to the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. The Antelope Valley State Water Contractor Association (AVSWCA), of which the City of Palmdale is part of, is an approved CASGEM "Monitoring Entity." As such, the additional data provided through the Proposed Project will be beneficial in providing supplementary regional representation.

Task 6: Groundwater Flow Model Update

The applicant proposes to generate data from both the groundwater monitoring program to updated the groundwater model developed by USGS. This local groundwater model will be

modified to address regional water-level changes as simulated by the regional groundwater-flow model. This modification with improve the ability to make more reasonable predictive scenarios and assist in providing improved data for use in recharge management decisions both locally and regionally. This includes a better understanding about how the water-level changes will occur at nearby wells within the Antelope Valley groundwater basin near the cities of Palmdale and Lancaster.

Task 7: Final Reporting

The City will prepare the final document required for completion of the Grant. Reports to be submitted to DWR's Project Manager include:

- Final Report: The City will prepare and submit to State, on completion of the project, an original Final Project Report and two copies. The City will submit the Final Report within ninety (90) calendar days of completion of all tasks associated with the proposed project. The Final Report shall include a description of actual work done, a final schedule showing actual progress versus planned progress, and copies of any final documents or reports generated or utilized during a project. The Final Project Report will be provided in hard copy and digital format prior to final payment of grant funds retained by State. Groundwater level and other data shall be submitted as part of the Final Report.

Goals and Objectives

The purpose of the Amargosa Project is to improve the understanding of hydrology and geochemistry of the aquifer system that underlies the Project Area. As part of the understanding, the effects of the proposed recharge along the Amargosa Creek will be investigated. Previously, the USGS had developed a local groundwater-flow model to simulate the effects of recharge. This was based on the available data at the time. The Amargosa Project will collect additional data to supplement the existing data to better refine the groundwater-flow model.

Work Items

Well Construction

Well construction will have two phases: preliminary work and construction. The USGS will be performing the work associated with both phases of the work.

In the first phase of well construction, the preliminary work will need to be completed. This includes well siting, well permits, and the design of the well. When the well is sited Underground Service Alert will be contacted to ensure that no underground utilities interfere with the drilling and construction of the well. Well permits will be obtained from the LACDPW and from the LACDPH. To obtain the well permits, a preliminary design for the well will be required. Final design will follow the geophysical logging of the boring.

The second phase will consist of the actual construction of the well. Equipment needed to drill, fabricate and develop the well will be mobilized to the well site. The site will need to be prepared for the construction activities. The borehole will be drilled. Following the drilling of the borehole, a geophysical log of the well will be performed. Well casing, gravel pack and a surface seal will be installed as required by the well design and permits. The well will be finished at the surface and the site cleanup performed.

The existing well at Site 3 will be redeveloped as part of the well construction.

Monitoring transducers will be installed at three sites for the collection of data.

Monitoring

The three sites will each have monitoring probes to collect water levels and groundwater temperatures. The USGS will download this data on a quarterly basis from each of the sites. This data will be uploaded to the database after first going through the appropriate quality control check.

In addition, the USGS will collect water quality samples from the three sites. Samples will be analyzed for major minerals, nutrients, selected trace elements, plus the stable isotopes for oxygen, hydrogen, and carbon-13. The samples will also be tested for the radioactive isotopes tritium and carbon-14. As part of the QA/QC process, duplicate samples and field blanks will be analyzed. Data will be uploaded to the database and USGS NWIS online database.

Project Deliverables

Quarterly reports will be provided to DWR on the progress for the Project. The Project will also generate groundwater level data which will be added to the CASGEM database. At the end of the monitoring, the local groundwater basin model will be calibrated. The calibrated model will then be used to model different recharge scenarios along the Amargosa Creek.

Site Access

The well locations are owned by the City. Therefore, no access issues exist.

Environmental Compliance and Permitting

Access for construction of the proposed project well will be along 20th Street West and Quick Street. The property is owned by the City. SAIC prepared an EIR (2009) for the Project Area. The EIR evaluated the various impacts from the proposed Project. The EIR states that there is a significant but unavoidable impact to air quality related to the construction of the Nature Park and recharge basins. The EIR states that there exists the potential for significant impacts to biological resources, cultural resources, geology and soils, and hydrology and water quality. However, the impacts are related to the significant movement of earth required for the construction of the Nature Park and recharge basins. Hydrology and water quality impacts are considered a

beneficial impact. It should be noted that the construction of the well site alone will have a less than significant impact to all of the above.

For construction of the well, two excavation permits will be required, one from LACDPW and one from LACDPH. Each agency has a form to be completed which includes location map for the well and an initial well design. It is anticipated that the process for obtaining these two permits will be approximately four months. Once permits are obtained, Underground Service Alert must be contacted prior to the commencement of drilling to protect any underground utilities. A Well Completion Report will be submitted to DWR following the completion of the well.

All other sites will be accessed along existing unpaved roads within the Project Area. The City owns the property for the existing sites.